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Income Shocks Reduce Human Capital Investments

Evidence from Five East European Countries

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Abstract

This paper empirically investigates whether households affected by income shocks cope by reducing human capital investments. The analysis uses Crisis Response Surveys conducted in Armenia, Bulgaria, Montenegro, Romania, and Turkey during 2009 and 2010. A propensity score matching technique is adopted to compare health and education investment decisions among households that were affected by income shocks to the matched comparison group. The authors find that households affected by income shocks reduced some human capital investments. Interestingly, households in these five countries were more likely to adopt health-related coping strategies as opposed to education-related coping strategies. The results from Armenia, Bulgaria, Montenegro, and Turkey show that households affected by income shocks reduced their visits to doctors and reduced their spending on medicine and medical care significantly more than the matched comparison group. Households affected by income shocks reduced their education investments, but did not adopt harmful education-related coping strategies, such as withdrawing children from schools or moving children from costly private to cheaper public schools. These findings reveal that long-term and possibly intergenerational household welfare could be affected by short-run income shocks and hence underscore the need for governments to employ mitigation measures.

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Income Shocks Reduce Human Capital Investments: Evidence from Five East European Countries

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1 Introduction

In the wake of the recent Global Financial Crisis (2007-2008), the impact of adverse events on families has gained renewed focus among policy makers and academics. However, adverse events are not always caused by aggregate shocks, which generally emanate from economic recessions, natural disasters, etc.; they could also be caused by idiosyncratic shocks, such as a death in the family, job loss, etc. Irrespective of the source of the shock, families adopt coping strategies to mitigate the impacts of these adverse events. These coping strategies generally consist of drawing on savings, increasing family labor supply (inserting non-working family members into the labor market or increasing the number of hours worked), accessing formal (government supported social assistance) or informal (remittances, charities, nongovernmental organizations, borrowing) safety nets, and reducing household expenditures (durable goods, food, clothing, etc.) and investments (human, financial etc.).

This paper studies whether households affected by income shocks cope by reducing human capital investments. We focus on coping strategies in human capital investments because of their potential longer term or intergenerational impact on household welfare. The paper exploits five unique Crisis Response Surveys (CRS) conducted in Armenia, Bulgaria, Montenegro, Romania, and Turkey during 2009 and 2010.[2] The timing of the surveys coincided with the effects of the recent global financial crisis. Despite the breadth and depth of the crisis, households were also affected by idiosyncratic shocks, as they are at any given time. However, the data available do not allow us to separate households affected by idiosyncratic and aggregate shocks.

To analyze human capital investment decisions by households in response to adverse income shocks, we adopt a propensity score matching (PSM) technique. We further focus on the health and education investment decisions of households affected by income shocks. Although the PSM technique has been used extensively in the literature, it is susceptible to hidden bias due to unobserved factors. We therefore perform sensitivity analyses using Mantel-Haenszel (M-H)

[2] According to the World Bank Classifications, Armenia is the only Lower Middle Income Country, while the other four countries are Upper Middle Income Countries.

bounds[3] approach and find that our results are robust and the influence of unobserved factors is insignificant.

We believe that the paper makes three main contributions to the literature. First, the paper draws attention to the impact of income shocks on human capital investment decisions, while much of the literature has focused on the impact of income shocks on long-term human capital outcomes. As such, the paper underscores the need for policy actions to mitigate the impact of income shocks and thereby protect long-term and possibly intergenerational household welfare. Second, the methodology adopted can be particularly useful during crises when policymakers lack timely information about household coping strategies regarding human capital investments. The paper establishes the causality between income shocks and human capital investment decisions with only a single cross-section of data. Third, by studying data from Eastern Europe, this paper studies a region of the world that has received less coverage in past work on income shocks and coping strategies.[4]

We find that households affected by income shocks cope by reducing some human capital investments. Interestingly, households are more likely to adopt health-related coping strategies as opposed to education-related coping strategies. The results from Armenia, Bulgaria, Montenegro, and Turkey show that households affected by income shocks reduce their visits to doctors and reduce their spending on medicine and medical care significantly more than the matched comparison group. Households affected by income shocks reduce their education investments, but did not adopt harmful education-related coping strategies, such as withdraw children from schools or move children from costly private to cheaper public schools.

The paper is organized as follows. Section 2 summarizes the literature on the impact of shocks and crises on human capital investments. Section 3 describes the data and Section 4 describes the methodology, including the sensitivity analysis. The penultimate section presents the results from

[3] M-H bound approach is used for binary outcome variables. Please refer to the Appendix for detail discussion. Also see Backer and Caliendo (2007).

[4] A number of studies have looked at the impact of past income shocks in Latin America and Eastern Asia on coping strategies. There is also a growing literature on Africa.

five countries in Eastern Europe where crisis response survey data are available. Finally, Section 6 summarizes the main findings and concludes.

2 Literature on the impact of income shocks on human capital investments

One of the most common strategies adopted by households to cope with income shocks is to reduce household expenditures (Azam, 2010; Chambers, 1989; Fiszbien, Giovahnoli, and Aduriz, 2003; World Bank, 2011). These expenditure reductions take many forms: substituting cheaper goods, delaying consumption of durable goods, reducing human capital investments by withdrawing children from schools, reducing visits to doctors, or reducing medicine and medical care utilization. Some of these coping strategies may lead to lower human capital accumulation and subsequently, lower lifetime earnings (see Case, Fertig and Paxon, 2005; Hoddinott et al. 2008; Ferreira and Schady, 2008). The choice of coping strategies, however, vary extensively across households depending on their social and economic status and location (Corbett,1988). Household human capital endowments also play a key role. Lokshin and Yemtsov (2001) find that during 1998-99 economic crisis in Russia, households with higher human capital choose strategies that included increasing home production and moving the place of residence to cope as compared to households with lower human capital endowments.

The impact of income shocks on human capital investments, especially education, is heterogeneous (UNESCO, 2000; Skoufias, 2003). Jacoby and Skoufias (1997) find that school attendance by rural poor children in India decreases as a consequence of adverse income shocks. Duryea (1998) for Brazil and Skoufias and Parker (2002) for urban Mexico, both find similar adverse effects on school attainment[5]. Evidence from Central and Eastern Europe and the Commonwealth of Independent states shows that the economic transition led to a reduction in enrollment (Paxon and Schady, 2005).

However, Mckenzie (2003) finds that school attendance rates rose among 15-18 year olds

[5] See World Bank (2011).

during the Mexican crisis. Thomas et al. (2004) observe a similar pattern in Indonesia after the East Asian Crisis. They show that poor households reduced education expenditure for younger children but protected their education investments for older children. Using survey data from 100 villages around Indonesia collected prior to the crisis in May 1997 and then three times after the onset of the crisis – in August and December 1998 and May 1999 – Cameron (2000) finds that school attendance dropped slightly during the crisis, but rebounded after the crisis to levels higher than prior to the crisis. King (2009) shows that per capita education expenditures declined more steadily in post-crisis Indonesia while dropout rates did not rise. This, King argues, is because of the sticky nature of enrollment, and because parents want to protect past education investments.

The conflicting findings are explained by aggregate shocks giving rise to opposing income and substitution effects. Decreases in income (adverse income effect) lead households to withdraw children from school, on one hand, while decreases in wages or poor labor market conditions during the crisis lowers the opportunity cost of schooling leading households to keep their children in school on the other hand. As a result, educational investments depend on whether the income effect or the substitution effect dominates.

Ferreira and Schady (2008) show that the impact of economic shocks on human capital investments and human development outcomes depends on the wealth of the country. They show that in richer countries, child health and education outcomes are counter-cyclical. In poorer countries, the outcomes are pro-cyclical — where infant mortality rises, and school enrollment and nutrition fall during recessions. In middle-income countries, the pattern is mixed – where health outcomes are generally pro-cyclical, and education outcomes are generally counter-cyclical. The authors suggest that richer countries, with deeper and better-functioning credit markets, are more likely to see improvements in both health and education during down-turns. School enrollments increase because the substitution effect dominates the income effect for households with greater access to credit markets.

While there is a substantial literature on linking income shocks with education investments, the literature on the impact of income shocks on health investments, however, is relatively sparse. The majority of studies link income shocks with longer-term health effects, such as, maternal health or

nutrition outcomes (Baird et al. 2007; Ferreira and Schady 2008; Paxon and Schady 2005).

There are, however, a few studies that analyze the link between income shocks and short-term health-related coping strategies. For example, Conceição et al. (2009) acknowledge that an income shock reduces the household's ability to pay for maintaining or improving health generally decreases and private spending on food, medicine and health care also decreases. Cutler et al. (2002) find that during the economic crisis in Mexico, out-of-pocket health expenditures on hospitalization, doctors visit and dental care declined (3.9 to 3.1 percent of GDP) between 1994 and 1995. The decline was more evident among families with elderly members and that led to higher mortality rates in post crisis Mexico. Frankenberg et al. (1999) report a significant decline in the proportion of household incomes spent on health in Indonesia. They show that public healthcare use declined sharply and the percentage of children under five visiting community primary health care centers fell by half.

3 Data

This paper analyzes data from five Crisis Response Surveys (CRS) conducted in Armenia, Bulgaria, Montenegro, Romania, and Turkey. All the surveys were conducted between mid-2009 and early-2010. These CRSs are shorter versions of regular household surveys (such as Living Standards Measurement Surveys) but special modules focus on income shocks and coping strategies. Although the survey contains information on whether incomes rose, fell or stayed the same, a key drawback of the surveys is that they have no measure of the intensity of the effect on any of the income components.[6] CRS for four countries were launched in rural and urban locations, but the Turkey CRS only surveyed urban households.

Households affected by income shocks are those households that report that any one of the following applies within the recall period (6-12 months): (i) wage rates of any working age individual in the household falls; (ii) working hours of any working age individual in the household

[6] Income modules are often difficult to implement and data from those modules are often suspect because households are reluctant to provide accurate information.

falls; (iii) any employed member of the household loses his/her job; and (iv) remittances into the household falls.

Based on the above criteria, we divide households (see Table 1) into two groups—"affected" and "not affected." In 2009, 32 percent of households in Armenia, 26 percent of households in Bulgaria, 20 percent of households in Montenegro, 17 percent of households in Romania, and 21 percent of households in Turkey report that at least one component of household income fell relative to 6 to 12 months earlier (see Table 1). In general, salary reductions outnumber job losses (World Bank, 2011). For example, six percent of sampled households in Turkey report a job loss, 20 percent report a wage rate reduction, and 7 percent report a reduction in hours of work (see Table 2). As discussed earlier, some of the reported income shocks are expected regardless of whether or not a crisis occurred, while the rest of the reported income shocks are likely due to the crisis.

Each CRS also contains a detailed module on the strategies adopted by the households to cope with income shocks. Although there is variation in coping strategies adopted, there are also commonalities across countries. We focus on some of the more harmful coping strategies that are linked directly to human capital investments. In health, we identify households that reduced the following relative to 6-12 months earlier: (i) visits to doctors; (ii) medical care expenses; or (iii) purchase of regular medications. Similarly, in education, we identify households that adopted the following coping strategy relative to 6-12 months earlier: (i) withdrew children from school; (ii) moved children from an expensive to cheaper schools; or (iii) postponed training (language courses, information technology courses, etc.) in school or college.

Table 3 presents the distribution of coping strategies in human capital investments. The distribution of coping strategies demonstrates some variation between affected and unaffected households across countries. In Armenia, for example, 43 percent of households cancel visits to doctors or health care centers. The incidence is 16 percentage points higher among households that report income shocks. In Montenegro, Romania and Turkey where 16.4, 8.7 and 20.8 percent household respectively reduced their regular visits to doctors or use of health services. While in some countries the difference between households affected and not affected is substantial (7-8

percentage points in Montenegro, 12 percentage points in Turkey), others show no difference. In Romania, 23.7 percent of households affected by income shocks and 20.5 percent of households not affected by income shocks report reducing visits to doctors.

Similar patterns are observed with respect to purchase of medicine. In Armenia, 38 percent households stopped buying medical care or medicine. Households affected by income shocks are 12 percentage points more likely to adopt the strategy than households not affected by income shocks. In Bulgaria, Montenegro and Turkey the differences between households affected and not affected with respect to purchasing medicine are 4, 13 and 10.5 percentage points respectively. In Romania, 22.7 percent of households affected by income shocks reduce medicine or medical care expenditures while 20.4 percent of households unaffected by income shocks adopt the same strategy.

Table 3 also shows that households changed their human capital investments in education. In Montenegro, 16.2 percent of affected households canceled or postponed their training courses in computer or language arts. In Bulgaria, 12.8 percent affected households reduced their education expenditure while only 6 percent of unaffected households did the same. Approximately, 7 percent more affected households canceled their children's extracurricular school activities than the unaffected households.

While the incidence of coping strategies differ across countries and sometimes look substantial between affected and unaffected household, causality can only be attributed with further empirical analysis. Moreover, there are other factors that can lead to unreliable results. For example, households that report that they are not affected by income shocks constitute a heterogeneous group with diverse vulnerability to the same economic shock. Therefore, simple group mean difference will lead to biased results. However, households that report income shocks may have more reasons to report adoption of coping strategies. To avoid selection bias, and any influence of unobserved factors in motivating households to report more income losses, we adopt a propensity score matching technique and sensitivity analysis. The next section describes the method and its relevance for this analysis in detail.

4 Methodology

We adopt a Propensity Score Matching (PSM) technique to isolate the impact of income shocks on households' human capital investment decisions. PSM hinges on two identifying assumptions. First, unconfoundedness or conditional independence has to be satisfied, i.e., $Y_1, Y_0 \coprod D|X$ (Rosenbaum and Rubin, 1983; Lechner, 1999). Where, Y_1, Y_0 refer to outcome variables for treated and comparison groups while D and X refer to the treatment and vector of observed covariates respectively. Second, an area of common support must be sufficiently large for matching and $0 < \Pr ob\{D = 1 \mid X = x\} < 1$.

When both assumptions are satisfied, conditional on observed household characteristics, the average impact (ATT) can be calculated as follows:

$$ATT=E(Y_1 - Y_0|D=1) = E(Y_1|D=1) - E(Y_0|D=1)$$

Where, the first component on the right hand side is the expected value of the outcome for households affected by an income shock (treated); and the second component is the expected outcome for the matched comparison (or counterfactual) group. The average treatment effect (ATT) provides an unbiased comparison of mean outcomes between households affected by income shocks and households that are not affected by income shocks but are similar in vulnerability to the affected households. We use Kernel matching for our analysis.

The included covariates, which satisfy the assumptions above, require that covariates: (i) are not affected by income shocks; (ii) are time invariant; and (iii) are derived from the same source and same environment (Caliendo and Kopeinig, 2008; Heckman et al., 1999). We include the following covariates to predict a household's propensity to be affected: demography, education attainment, ethnicity, religion, native language, location (settlement type), and household's asset index. The specification chosen is based on past works, but the following is a brief description of the expected impacts of the variables. First, the proportion of family members in different age groups is used to control for cohort specific vulnerability to income shocks. For example, a majority of people over 64 years are pensioners and hence, the risk of income shocks is likely much lower than if they were working age adults. Second, educational attainment is included

because income shocks may pose a unique challenge to particular skill groups. Past work has found, for example, that recessions diminish labor market prospects of less-qualified youth and greatly increase their vulnerability to long-term unemployment (World Bank, 2006, World Development Report, 2007). Third, household head's ethnicity and religion, and the location of the home are included. Although these factors may affect job prospects and hence, household income, ex-ante, we are not certain about the correlation between these household characteristics and income shocks. De Wall (1990), however, suggests that different religious and ethnic backgrounds lead households to react differently during crises. The covariates are balanced to test the hypothesis that 'covariates are jointly insignificant'. Table 5 presents the results for this hypothesis test.

Selection of an appropriate model is equally important for good matching. Since we have a binary treatment (meaning households are either affected or not affected by income shocks), we chose a probit model of the following form:

$$P_i[D = 1] = \alpha + \sum_{j=n} \beta_j x_{ij} + \partial z_i + \gamma w_i + \omega m_i + \kappa d_i + \varepsilon_i$$

where, x_i represents demographic characteristics of the household, i; z_i represents educational attainment; w_i is a dummy variable for ethnicity; m_i is a dummy variable for religion; and d_i is a location dummy. Table 4 reports the contribution of these covariates to a household's predicted vulnerability to income fluctuations. The key question to be answered here is whether households affected by income shocks respond differently to households not affected by income shocks. The predicted value or the propensity score derived from this model converts the multidimensional relation to single dimension and makes it easier to select the *similar* households in the comparison group. Based on propensity scores, Figure 1 presents the area of common support for each country and provides evidence that the criterion on sufficient common support for PSM is satisfied.

4.1 Sensitivity analysis

The semi-parametric approach employed in this paper eliminates potential bias from observable variables. However, this approach is not robust to hidden bias from unobserved variables which

can be correlated with treatment and outcome variables (Rosenbaum, 2002; Becker and Caliendo, 2007; DiPrete and Gangl, 2004).

We address this problem with the bounding approach, proposed by Rosenbaum (2002). Rosenbaum bounds provide evidence of the degree to which any results are influenced by unobserved variables. The bounding approach is useful to indicate whether inferences about treatment effects are sensitive to unobserved factors (Baker and Caliendo, 2007). Because our outcome variables are binary by nature (human capital investment coping strategies adopted: yes=1; no=0), Rosenbaum bounds are computed using the Mantel and Haenszel statistics for binary outcomes (Aakvik, 2001). Here, the null hypothesis is that income shocks have no effect on coping strategies adopted by households. The test, therefore, helps to compare households that report being affected by income shocks with households that are equally likely to be affected by income shocks, but do not report that they are "affected". See Appendix for more details on this method.

We expect a positive (unobserved) selection bias, meaning that those households most likely to report being affected are also the most likely to report adoption of harmful coping strategies. This bias may lead to an overestimation of the true treatment effect and therefore, reported test-statistic should be adjusted downwards. Hence, following Aakvik (2001), we will look at Q^{+}_{MH} and p^{+}_{mh} statistics for our sensitivity analysis. We choose upper bounds of our results based on the significance levels for Γ = 1, 1.25, 1.5, 1.75 and 2. The Q^{+}_{MH} statistic adjusts the MH statistic downward for the case of positive (unobserved) selection.

5 Results

Figure 1 shows that all five countries have sufficient area of common support to reliably apply the propensity score matching technique. Table 5 presents the results from the covariate balancing exercise for robust matching based on observable household characteristics. Panel I of the table shows the percentage reduction in selection bias after balancing. Panel II shows the null hypothesis that— all covariates between the treatment and control group are jointly insignificant— is not rejected for all countries except for Bulgaria. The balancing reduces the selection bias significantly

for Bulgaria as well but fails to accept the null hypothesis. We however, accept the closest match possible without more stringent balancing because observations of households affected by income shocks would be lost.

We find that households affected by income shocks reduce some human capital investments to cope with the shock. Interestingly, households are more likely to adopt health-related coping strategies as opposed to education-related coping strategies. The results from Armenia, Bulgaria, Montenegro, and Turkey show that households affected by income shocks reduce their visits to doctors and reduce their spending on medicine and medical care significantly more than the matched comparison group. Households affected by income shocks reduce their education investments, but did not adopt harmful education-related coping strategies, such as withdraw children from schools or move children from costly private to cheaper public schools.

5.1 Health investments

Table 6 reports the average treatment effects (on treated) for health investments. To evaluate the impact of income shocks on health-related investments, the following indicators are studied: reducing visits to doctors, reducing spending on medicine and medical care or canceling health or life insurance. We find statistically significant differences in the adoption of harmful health-related coping strategies between households affected by income shocks and the matched comparison group. The results from Armenia, Bulgaria, Montenegro, and Turkey show that households affected by income shocks (i) reduce their visits to doctors and (ii) reduce their spending on medicine and medical care significantly more than the matched comparison group. In Romania, the difference between households affected by income shocks and the matched comparison group is not significant, albeit the incidence of adoption of these strategies from households affected by income shocks and the matched comparison group is high.

In Armenia, households affected by income shocks adopt harmful health-related coping strategies more often than the matched comparison group. Households affected by income shocks are 15 percentage points more likely to reduce visits to doctors and spend 14 percentage points less on medicines as compared to households in the matched comparison group. In fact, households

affected by income shocks are 16 percentage points more likely to adopt at least one of the above coping strategies relative to the matched comparison group, and most households adopt both measures.

In Bulgaria, households affected by income shocks reduce visits to doctors, and reduce medical care expenditures significantly as compared to the matched comparison group. At least 24 percent of households affected by income shocks reduce visits to doctors as compared to only 9 percent from the matched comparison group. In other words, households affected by income shocks are 15 percentage points more likely to reduce visits to doctors than the matched comparison group. Households affected by income shocks reduce their medical care expenditures by 9 percentage points more than the matched comparison group. However there is no statistical difference between households affected by income shocks and the matched comparison group on the incidence of health insurance cancelation. Affected households are about 21 percentage points more likely to adopt at least one harmful coping strategy than the matched comparison group.

In Montenegro, households affected by income shocks reduce visits to doctors, reduce their spending on medical care, and cancel medical/life insurance more often as compared to households in the matched comparison group. Households affected by income shocks are 5 percentage points more likely to reduce visits to doctors; 15 percent more likely to reduce their spending on medical care and 8 percentage points more likely to cancel their medical/life insurance as compared to the matched comparison group. In fact, affected households are 15 percentage points more likely to adopt at least one harmful coping measure than the matched comparison group, while most households affected by income shocks adopt multiple health-related coping strategies simultaneously.

The pattern of health care usage, however, differs considerably in Romania from the countries discussed above. There is no significant difference between households affected by an income shock and the matched comparison group, despite a high rate of adoption of health-related coping strategies. Among households affected by income shocks, 22 percent reduce or cancel visits to doctors as compared to 19 percent from the matched comparison group; and 20 percent reduce medicine or medical care purchases as compared to 16 percent from the matched comparison

group. In fact, 25 percent of households affected by income shocks choose at least one of the above health-related coping strategies. The lack of variation between households affected by income shocks and households in the matched comparison group underscores a general trend in the economy, namely to reduce health care usage regardless of whether or not the household suffered an income shock. One explanation might be low overall consumer confidence, leading to lower health investments.

In Turkey, households affected by income shocks reduce doctors' visits and reduce medical care utilization significantly compared to households in the matched comparison group. Households affected by income shocks are 9 percentage points more likely to reduce visits to doctors and 9 percentage points more likely to reduce medical care expenditures compared to the matched comparison group. Households affected by income shocks are 12 percentage points more likely to adopt at least one of the above health-related coping strategies as compared to the matched comparison group.

The above findings are consistent with findings in Frankenberg et al. (1999) for Indonesia, and Cutler et al. (2002) for Mexico, where they show that households' out of pocket expenditure for medical care and medicines, visits to doctors or primary health care facilities declined after the crisis. Cutler et al. further argue that these health care usage declines were more prevalent among households with elderly people, leading to a higher mortality rate in post crisis Mexico. If such short run coping strategies indeed caused an increase in mortality rates, as Cutler et al. argue, then our findings from the five East European countries can be viewed as an early warning for a significant deterioration in human development outcomes.

5.2 Education investments

Table 7 reports the average treatment effects (on treated) for education investments. In the five countries studied here, households affected by income shocks reduce their education investments, or adopt education-related coping strategies, but do not adopt harmful education related coping strategies. In other words, the difference in the adoption of harmful education-related coping

strategies between households affected by income shocks and the matched comparison group is statistically insignificant. We define harmful education-related coping strategies as ones were households withdraw children from schools or move children from costly private to cheaper public schools. However, households affected by income shocks did adopt some education related coping strategies, such as reducing spending on schooling, reducing the share of school spending among total expenditures, postponing training (language courses, information technology courses, etc.), or postponing admission to school or college.

In Turkey and Bulgaria, households affected by income shocks reduce their share of education expenditures among total household expenditures relative to the matched comparison group, whereas households in Armenia, Montenegro and Romania do not. Households affected by income shocks in Montenegro cancel or postpone training or admission to schools or colleges relative to households in the matched comparison group. In Romania, households affected by income shocks cancel their children's extracurricular activities.

In Armenia, there is no significant difference in education-related coping strategies between households affected by an income shock and the matched comparison group. Table 7 shows that the incidence of households withdrawing children from regular schools or postponing training is less than 1 percent (insignificant) between households affected by income shocks and the matched comparison group.

In Bulgaria, households affected by income shocks reduce education spending, but do not withdraw children from regular schools, nor do they cancel training relative to households in the matched comparison group. Affected households are 15 percentage points more likely to reduce education spending than the matched comparison group. However, the difference between households affected by income shocks and the matched comparison group with respect to withdrawing children from schools or canceling training is insignificant.

In Montenegro, the difference between households affected by income shocks and the matched comparison group is insignificant with respect to: (i) withdrawing students from school; (ii) moving children from expensive to cheaper schools; and (iii) reducing education expenditures. However, households affected by income shocks are more likely to postpone training or admission

to schools or college relative to the matched comparison group. Households affected by income shocks are 10 percentage points more likely to postpone training than the matched comparison group. Despite the low incidence of adopting an education-related coping strategy in Montenegro, households affected by income shocks are 11 percentage points more likely to adopt at least one education-related coping strategy than the matched comparison group.

In Romania, households affected by income shocks are 6 percentage points more likely to withdraw their children from extracurricular activities than the matched comparison group. Unfortunately, no other education-related coping strategies are measured in the survey.

In Turkey, relative to the control group, households affected by income shocks generally keep their children in school and do not postpone training, but they do move children from expensive to relatively cheaper schools and reduce educational expenditures. Households affected by income shocks are 2 percentage points more likely to move their children from expensive to relatively cheaper schools and 5 percentage points more likely to reduce average education expenditures than the matched comparison group. However, the incidence of children being withdrawn from schools or people postponing training is not significantly different between households affected by income shocks and the matched comparison group.

Our findings for Bulgaria and Turkey are consistent with the views of Thomas et al. (2004) and King (2009) that households reduce education expenditures more steadily in post-crisis period. We also find that households postponed training in Montenegro and reduced participation in extracurricular activities in Romania.

5.3 Sensitivity analysis: MH bounds

Table 8 and 9 reports the MH bound test results for health and education variables respectively. We calibrate the MH bound test for different values of Γ between 1 and 2 with an increment of 0.25. When $\Gamma=1$ there is no hidden bias, while higher values of Γ indicates more influence of unobserved factors. Because it is possible that households that report being affected by income shocks are more likely to report adopting coping strategies, a downward adjustment in the upper bound for all health-and education-related coping strategies average treatment effects is needed. The reported

test statistic Q^{+}_{MH} provides the upper bound with corresponding level of significance $p^{+}_{mh.}$

The sensitivity analysis suggests that the results are robust for all health-related coping strategies and are insensitive to unobserved factors even for a high value of Γ <=1.75 for most countries. The average treatment effects hold for Γ <=1.5 for Armenia and Γ <=2 for Bulgaria indicating insensitivity to a bias that would almost double the odds of exposure to the income shocks. For Romania, our results hold while Γ <=1.5 but become significantly different between affected households and the matched comparison group when Γ >1.5. In Montenegro, the results are mixed. The treatment effects of canceling life insurance is insensitive to unobserved factors when Γ <=2, of reducing expenditures on medical care or medicine when Γ <=1.75, while the treatment effect of reducing visits to doctors is highly sensitive even for Γ=1.25. The sensitivity analysis for Turkey shows that the results are sensitive to unobserved factors and a significant amount of hidden bias can dilute the results even for a low value of Γ =1.25. The sensitivity analysis for education-related coping strategies also shows no significant influence of unobserved factors. In Armenia, Bulgaria and Montenegro, the results hold and do not alter for Γ <=2, indicating insensitivity to a bias that would double the odds of exposure to the income shocks. For Romania, the average treatment effects become sensitive to hidden bias at Γ=1.5 while in Turkey the treatment effects are mostly insensitive to a bias that would double the odds of exposure to the income shocks, except for moving children to less expensive schools. The significant difference between the affected households and the matched comparison group starts fading at Γ=1.5.

6 Conclusions

When income shocks affect households adversely, households cope by drawing on savings, increasing family labor supply, accessing formal or informal safety nets, and reducing household expenditures and investments. This paper adopts a propensity score matching technique to study whether households affected by income shocks cope by reducing human capital investments. The

analysis is conducted using five Crisis Response Surveys from Armenia, Bulgaria, Montenegro, Romania, and Turkey.

Findings from the 5 countries reveal that households reduce some human capital investments to cope with income shocks. In fact, sampled households are more likely to adopt health-related coping strategies as more often than education-related coping strategies. The results from Armenia, Bulgaria, Montenegro, and Turkey show that households affected by income shocks (i) reduce visits to doctors and (ii) reduce spending on medicine and medical care significantly more than the matched comparison group. Households affected by income shocks reduce education investments, but do not adopt harmful education-related coping strategies, such as withdrawing children from schools or moving children from costly private to cheaper public schools.

We interpret the evidence that households adopt health related coping strategies over education related coping strategies as evidence that parents tend to protect education investments because out-of-pocket expenses for education are low in all five countries studied here and because disrupting education even temporarily can be difficult to reverse. King (2009) argues that school enrollments are generally sticky in the short run because parents are reluctant to pull their children out of school in the middle of an academic year. Thomas et al. (2004) find that households affected by income shocks in Indonesia protected education investments of older children, sometimes at the expense of the younger children in the household. In addition, households may perceive a shock to be temporary and hence, may be reluctant to impact their child's long term human capital accumulation by withdrawing the child from school.

On the other hand, utilization of health services, even in countries that provide "free" services, usually has some out-of-pocket expenses associated with the utilization. Frankenberg et al. (1999) and Cutler et al. (2002) also find that households affected by income shocks reduced health care utilization in Indonesia and Mexico during crises because of the out-of-pocket expenses. Furthermore, missing a health care appointment or missing a few doses of medicines may not always lead to bad health outcomes.

Implicit in our analysis in this paper is that households maximize long term welfare prior to the income shock and therefore, any reductions in human capital investments after the shock are

assumed to be welfare reducing. However, this may not be the case because the income shocks, especially aggregate income shocks, may lead to new welfare maximizing equilibria, including those with lower human capital accumulation. Policymakers may then choose to intervene if the social welfare of the population can be increased by providing incentives to increase human capital investments.

These human capital investment decisions can pose long-term effects on households and as such, policy makers may find it advantageous to provide households with instruments to mitigate the impact of income shocks. For countries in Eastern Europe and Central Asia, following World Bank (2011), we suggest that governments can follow a three pronged strategy. First, strengthen automatic stabilizers, such as unemployment insurance and poverty targeted social assistance, to ensure that programs are able to respond to the increased demand for safety nets. Ensure unemployment insurance and social assistance program coverage is sufficiently broad, centralize social assistance financing so that local government budget constraints do not impede registering needy people for social assistance, and upgrade program administration to improve targeting and response times. Second, adjust safety net program parameters to reflect changing household conditions. For example, during natural disasters or economic recessions, safety net parameters can be adjusted to improve government responses; for example, by lengthening the duration of unemployment insurance benefit payouts or reducing the activation conditions associated with social assistance programs when jobs are scarce. Third, activate new safety net programs to fill coverage gaps. When existing safety nets cannot respond fully, new programs can be started to reach uncovered vulnerable people. Public works, for example, can be an effective labor market program during aggregate shocks, especially labor market shocks, because it creates jobs while also addressing small-scale infrastructure development goals.

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Appendix

Rosenbaum Bound Approach for binary outcome variables

To find out Rosenbaum bound (2002) for binary outcomes, we use the Mantel and Haenszel statistics as suggested by Aakvik (2001). In our paper it tests the null hypothesis that the perceived income shock has no effects on the strategies adopted by households to cope with the shock. The test helps us comparing the households reported "affected" by the income shocks against households who are equally likely, but did not report "affected"[7]. To understand the underlying argument, let us assume that the probability that a household, i, reports "affected" is $P_i = P(x_{i,}u_i) = F(\beta x_i + \gamma u_i)$, where x_i are observed characteristics for individual, i. Parameter $\gamma$is the influence of unobserved factor, u_i, in household's decision to report affected. the odds that the person, i, reports "affected", as compared to person, j, who did not report "affected" will be

$$\frac{P_i(1-P_j)}{P_j(1-P_i)} = \frac{\exp(\beta xi + \gamma ui)}{\exp(\beta xj + \gamma uj)}$$

Now, when an almost identical person is identified in the comparison group (claimed "unaffected") through balancing observed covariates, i.e., $xi = xj$, it leads to the odds ratio to be

$$\frac{P_i(1-P_j)}{P_j(1-P_i)} = exp[\gamma(u_i - u_j)]$$

The above formulation suggests that when the covariates of a person reported "affected" are almost similar to a person who is equally likely but did not report "affected", then the odds of the person to report "affected" depends on the difference in unobserved factor, $(u_i - u_j)$, or the parameter, γ. Now, with the assumption that the unobserved factor is a binary variable, i.e., $u \in \{0,1\}$where u=1 indicates reporting "affected", then the odds of reporting "affected" will be bounded by

[7] See Aakvik (2001), Backer and Caliendo (2007) for detail explanations.

$$\frac{1}{\Gamma} \leq \frac{P_i(1-P_j)}{P_j(1-P_i)} \leq \Gamma \qquad \text{where } \Gamma = exp^{\gamma}$$

From the above expression, $\Gamma = 1$ suggests no hidden bias due to unobserved factors and upper and lower bounds are exactly equal to the estimated statistics, Q_{mh}. As this value increases the relative odds of reporting "affected" increases. The M-H bounds reports two values of Q_{mh} , Q^{+}_{mh} and Q^{-}_{mh} .If there is a higher probability of overestimation, i.e., higher odds of reporting "affected" then the statistic of interest is $Q^{+}_{mh,}$ and the focus is to find out its bound where the effects of unobserved factors on outcomes are altered. The parameter, p^{+}_{mh} shows the level of significance for each Q^{+}_{mh} and based on this p^{+}_{mh} we can find the bounds for treatment effect on each outcomes.

Aakvik (2001) notes that the Mantel and Haenszel (MH) test can be used to test for no treatment effect both within different strata of the sample and as a weighted average between strata. Under the null-hypothesis of no treatment effect, the distribution of *y* is hyper geometric. With N_{1s} and N_{0s} as the numbers of treated and non-treated individuals in stratum s, where $N_s = N_{0s} + N_{1s}$. Y_{1s} is the number of successful participants, Y_{0s} is the number of successful non-participants, and Y_s is the number of total successes in stratum s, the test-statistic Q_{mh} follows asymptotically the standard normal distribution and is given by:

$$Q_{mh} = \frac{U^2}{var(U)}$$

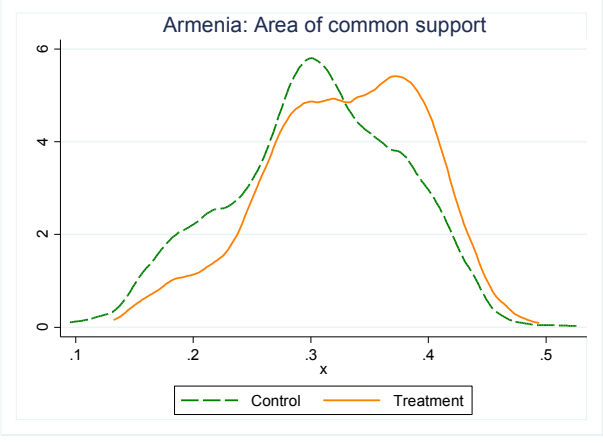
Where,

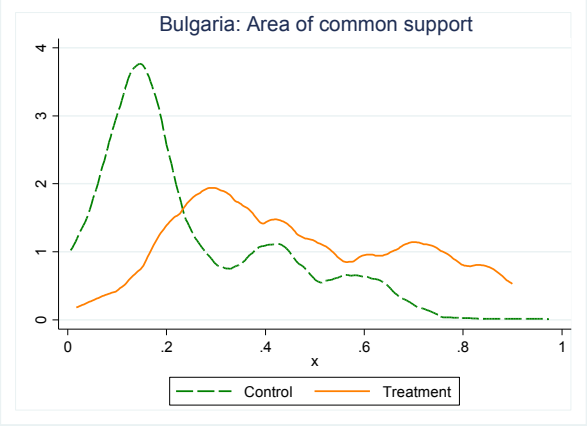
$$U^2 = \left[\sum_{s=1}^{S}\left(y_{1s} - \frac{n_{1s}y_s}{n_s}\right)\right]$$

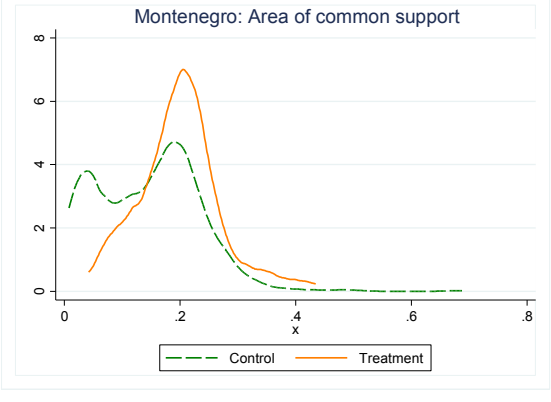
$$var(U) = \sum_{s=1}^{S}\left(\frac{n_{1s}n_{0s}y_s(n_s - y_s)}{{n_s}^2(n_s - 1)}\right)$$

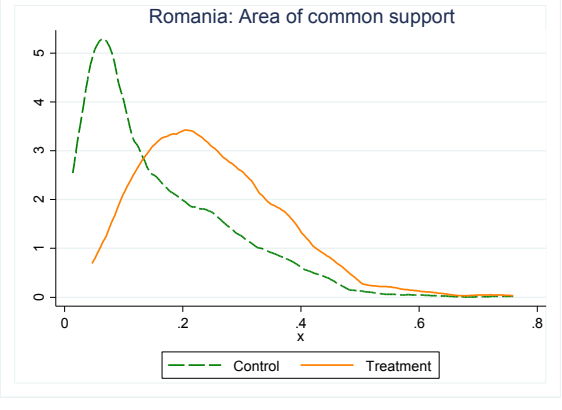
As Aakvik (2001) suggests, this statistic is chi-square distributed with 1 *d.f.*

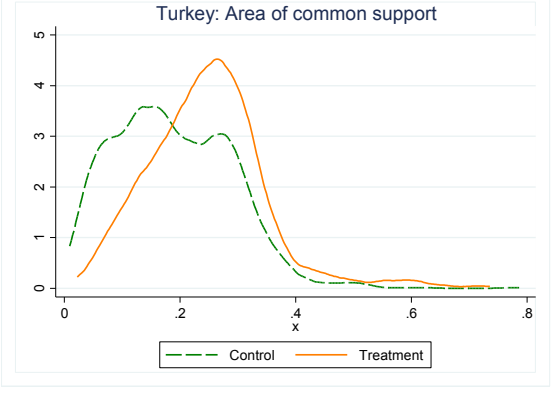
Figure 1: Area of common support between treatment (households affected by income shocks) and control group (households not affected by income shocks) across 5 countries











Note: Kernel density plot for the affected and not affected households before matching.

Annex 1

Table 1: Distribution of households affected by income shocks

Country	Households reported income shock (%)	Households reported no income shock (%)	Total no. of households surveyed
Armenia	31.7	68.3	3,930
Bulgaria	26.1	73.9	1,434
Montenegro	19.8	80.2	1,170
Romania	17.3	82.7	1,687
Turkey	20.5	79.5	2,102

Source: Based on information collected through Crisis Response Surveys.

Table 2: Reported transmission channels of income shocks (%)

	Individual level				**Household level**		
Country	Job Loss	Salary reduction	Hours of work reduced	Any	Labor market	Remittances	Any
Armenia					16.7	18.6	31.7
Bulgaria	5.00	36.9	22.3	36.9	24.1	2.2	26.1
Montenegro	3.36	10.18	4.54	15.14	17.2	3.8	19.8
Romania	4.27	11.64	3.8	17.26	17.3		17.3
Turkey	6.11	20.21	6.81	27.52	20.4	0.3	20.5

Source: Based on information collected through Crisis Response Surveys. Armenia did not have individual module in the survey.

Table 3: Distribution of human development investment decisions by households affected and not affected by income shocks

No	Coping strategies in human capital investments	Crisis-affected	Not affected	All
Armenia	Reduced or stopped visits to healthcare centers	52.2	38.4	42.9
	Reduced or stopped buying medical care or medicines	46.3	33.6	37.7
	Withdrew or postponed admission to school, college or kindergarten	2.6	0.8	1.5
	Took one or more children out of school	0.5	0.4	0.4
Bulgaria	Reduced or postponed buying regular medicines	22.3	18.2	19.4
	Postponed or skipped visits to the doctor after falling ill	14	9.8	11
	Postponed or skipped visiting the doctor for preventative care	12.1	8.3	9.4
	Reduced other types of educational expenditures	12.8	6	7.9
	Cancelled health insurance (for self-employment activity)	7.5	2.2	3.7
	Stopped paying into pension or social security contributions	7.5	1.8	3.4
	Postponed/ withdrew from training course	1.3	1.5	1.5
	Postponed/ withdrew a child from preschool or kindergarten	1.6	1.1	1.2
	Withdrew from primary or secondary school	0.4	0.5	0.5
	Postponed/ withdrew from university	0.4	0.1	0.2
Montenegro	Replaced use of private medical care with public medical care	26.5	13.6	16.4
	Reduced visits to doctor for preventive medical care	15.4	6.8	8.7
	Left or postponed intended training courses (computers, languages, etc)	16.2	6	8.2
	Stopped buying regularly prescribed medication	5	4.2	4.4
	Cancelled health or pension insurance for self-employment activity	11.5	1.5	3.7
	Cancelled paying life insurance	8.1	1.9	3.3
	Withdrew or postponed admission to school, college or kindergarten	4.2	2.3	2.7
	Decided to acquire new skills, education or training	5.8	1.3	2.3
	Moved from private to public school or kindergarten	3.5	1.1	1.6
	Moved to a less expensive school or kindergarten	1.9	1.2	1.3
Romania	Delayed or renounced medical visits	23.7	20.5	21.1
	Reduced buying of needed medicines	22.7	20.4	20.8
	Renounced the extra-school activities for children	16.4	9.3	10.5
	Started courses / trainings in order to acquire new skills	9	3.2	4.2
Turkey	Reduced the use of health services	26.7	16.2	18.7
	Reduced visits to the doctor for preventive medical control	27	14.9	17.8
	Left courses of language, computer, others.	6.8	1.6	2.9
	Withdrew or postponed the admission to school, college or kindergarten.	2.9	2.2	2.4
	Cancelled health insurance	4.2	1.5	2.1
	Transferred children from private to public school	2.4	0.9	1.3
	Transferred children to cheaper public or private school	1.9	0.7	1

Table 4: Determinants of Propensity Scores (probability of being affected by an income shock)

Probability of being affected by an income shock	Armenia	Bulgaria	Montenegro	Romania	Turkey
Household size	0.044**	0.048	0.132**	0.219**	0.135**
Age of the household head	-0.003	0.002	-0.009*	-0.166**	-0.017**
Gender of the household head	0.066	-0.209*	0.189	-0.05	0.239*
Proportion of working age population within age group 19 and 25years	0.270*	-0.099	0.32	0.591	-0.509**
Proportion of working age population within age group 26 and 60years	0.303**	0.322*	0.379*	-0.413	0.195
Location dummy (Urban=1)	0.211**	0.145	-0.029	0.197*	
HH asset index	0.005	0.016	-0.006		0.066
Language spoken at home					0.038
Ethnicity:					
Montenegran			0.577*		
Serbian			0.589*		
Yugoslavian			0.523		
Albanian			1.032**		
Bosnian			0.457		
Moslems			1.148**		
Romanian		0.385	0.121	-0.281	
Croatian			0.377		
Other		1.405*	1.38**	-0.388	
Bulgarian					
Turkish		0.517*			
Religion:					
Christian		-0.002	-0.752		
Muslim		-0.514*	-0.559		
Roman Catholic			-0.62		
No religion		-0.018			
Highest education: Primary Education	0.486*		-0.04		-0.207
Secondary Education	0.380**	0.078	-0.035	0.227**	-0.3
Under graduate	0.340**	-0.168	-0.133	0.017	-0.776**
Post graduate	0.273**	-0.317*			
Constant term	-1.120***	-0.567	-1.142*	-0.40	-0.599
Observation	3926	1398	1167	1709	2102
LR χ^2 (11)	99.130	62.24	94.99	172.1	146.98
p $>\chi^2$	0.000	0.000	0.000	0.000	0.000
Log likelihood	-2384.160	-908.020	-505.550	-700.11	-988.81
Pseudo R^2	0.020	0.033	0.086	0.1095	0.0692

Table 5: Balancing covariates

	Armenia		Bulgaria		Montenegro		Romania		Turkey	
Variable	% Reduction in |Bias|	p>t	% Reduction in |Bias|	p>t	% Reduction in |Bias|	p>t	% Reduction in |Bias|	p>t	% Reduction in |Bias|	p>t
	71.0	0.20								
Panel I										
Household size			-13.2	0.03	57.2	0.07	85.6	0.26	88.4	0.446
Age of the household head	91.2	0.76	45.0	0.00	60.9	0.14	91.8	0.56	71	0.06
Gender of the household head	98.4	0.96	-5.6	0.34	89.9	0.17	86.8	0.76	100	1.00
Proportion of working age population within age group										
19 and 25years	75.4	0.54	22.2	0.00	23.7	0.28	99.1	0.99	84	0.811
26 and 60years	96.6	0.89	78.3	0.00	45.3	0.03	16.8	0.11	75.3	0.875
Location dummy (Urban/rural)	68.5	0.28			14.8	0.86	88.5	0.73		
HH asset index	67.9	0.40			57.9	0.14			21.3	0.644
Highest education attainment										
Primary	-1434.6	0.23			-388.5	0.69	85.1	0.59	100	1.00
Secondary	70.1	0.75	3.6	0.55	-13.8	0.68	81.8	0.89	-101.2	0.733
Tertiary	87.9	0.89	-27.7	0.00	58	0.41			76.6	0.285
Panel II										
Ho: All covariates are jointly insignificant										
Pseudo R^2	0.001		0.246		0.019		0.010		0.005	
LR χ^2	4.850		390.210		14.310		6.890		5.930	
p> χ^2	0.938		0.000		0.112		0.736		0.820	

Table 6: Average treatment effects: Health investments across 5 countries

		Mean Value				
Country	Coping strategy	Treated	Controls	Difference	S.E.	T-stat
Armenia	Reduced visits to doctor	0.49	0.34	0.15	0.02	6.36
	Reduced spending on medical care or medicine	0.43	0.29	0.14	0.02	6.16
	Adopted at least one harmful strategy	0.55	0.39	0.16	0.02	6.78
Bulgaria	Reduced visits to doctor	0.24	0.09	0.15	0.07	2.15
	Reduced spending on medical care or medicine	0.11	0.02	0.09	0.04	2.61
	Cancelled health insurance	0.02	0.02	0.01	0.03	0.19
	Adopted at least one harmful strategy	0.32	0.11	0.21	0.07	2.91
Montenegro	Reduced visits to doctor	0.11	0.05	0.05	0.03	1.72
	Reduced spending on medical care or medicine	0.26	0.12	0.14	0.05	3.12
	Reduced spending on medicine	0.04	0.02	0.02	0.02	0.96
	Cancelled life insurance	0.08	0.00	0.08	0.02	3.59
	Adopted at least one harmful strategy	0.31	0.17	0.15	0.05	2.94
Romania	Reduced visits to doctor	0.22	0.19	0.03	0.03	0.84
	Reduced spending on medical care or medicine	0.20	0.16	0.05	0.03	1.40
	Adopted at least one harmful strategy	0.27	0.21	0.06	0.04	1.51
Turkey	Reduced visits to doctor	0.23	0.14	0.09	0.03	3.11
	Reduced spending on medical care or medicine	0.26	0.16	0.09	0.03	3.01
	Adopted at least one harmful strategy	0.35	0.23	0.12	0.03	3.29

Table 7: Average treatment effects: Education investments across 5 countries

		Mean Value				
Country	Coping strategy	Treated	Controls	Differenc e	S.E.	T-stat
Armenia	Withdrawn children from school	0.00	0.00	0.00	0.00	0.55
	Postponed training	0.01	0.01	0.00	0.00	1.16
	Adopted at least one harmful strategy	0.01	0.01	0.00	0.01	0.82
Bulgaria	Reduced education spending for children	0.22	0.07	0.15	0.03	4.71
	Withdrawn children from school	0.01	0.00	0.01	0.01	0.49
	Postponed training	0.00	0.00	0.00	0.01	0.17
	Adopted at least one harmful strategy	0.23	0.07	0.16	0.03	4.74
Montenegro	Withdrawn children from school	0.04	0.02	0.02	0.02	1.12
	Reduced education spending for children	0.02	0.01	0.00	0.00	0.40
	Moved children to less expensive school	0.03	0.03	0.01	0.02	0.31
	Postponed training	0.15	0.05	0.10	0.03	3.01
	Adopted at least one harmful strategy	0.18	0.07	0.11	0.04	2.75
Romania	Renounced the extra-school activities for children	0.15	0.09	0.06	0.03	2.13
	Adopted at least one harmful strategy	0.15	0.09	0.06	0.03	2.13
Turkey	Withdrawn children from school	0.04	0.03	0.01	0.01	0.49
	Reduced education spending for children	0.13	0.08	0.05	0.02	2.08
	Moved children to les expensive school	0.03	0.01	0.02	0.01	1.96
	Postponed training	0.04	0.03	0.01	0.01	0.94
	Adopted at least one harmful strategy	0.10	0.07	0.03	0.02	1.55

Table 8: Mantel-Haenszel bounds for health investments

Country	Coping strategies	MH Test statistics	Gamma (Γ) 1	1.25	1.5	1.75	2
Armenia	Reduced visit to doctors	Q_mh+	7.18	4.71	2.71	1.02	0.35
		p_mh+	0.00	0.00	0.00	0.15	0.36
	Reduce spending on of medical care or medicine	Q_mh+	6.60	4.20	2.25	0.60	0.73
		p_mh+	0.00	0.00	0.01	0.27	0.23
	Adopted any one harmful strategy	Q_mh+	7.65	5.15	3.11	1.39	0.00
		p_mh+	0.00	0.00	0.00	0.08	0.50
Bulgaria	Reduced visit to doctor	Q_mh+	5.60	4.30	3.26	2.40	1.66
		p_mh+	0.00	0.00	0.00	0.01	0.05
	Reduced spending on medical care or medicine	Q_mh+	5.37	4.52	3.86	3.32	2.87
		p_mh+	0.00	0.00	0.00	0.00	0.00
	Cancelled health insurance	Q_mh+	0.45	-0.02	-0.08	0.23	0.51
		p_mh+	0.32	0.51	0.53	0.41	0.31
	Adopted at least one harmful strategy	Q_mh+	7.52	6.10	4.96	4.02	3.21
		p_mh+	0.00	0.00	0.00	0.00	0.00
Montenegro	Reduced visit to doctors	Q_mh+	1.79	1.28	0.88	0.54	0.25
		p_mh+	0.04	0.10	0.19	0.30	0.40
	Reduced spending on medical care or medicine	Q_mh+	2.77	2.04	1.44	0.95	0.52
		p_mh+	0.00	0.02	0.07	0.17	0.30
	Reduced spending on medicine	Q_mh+	0.39	0.08	-0.17	-0.35	-0.18
		p_mh+	0.00	0.00	0.01	0.02	0.02
	Cancelled life insurance	Q_mh+	2.92	2.60	2.34	2.15	1.98
		p_mh+	0.00	0.00	0.00	0.02	0.02
	Adopted at least one harmful strategy	Q_mh+	2.84	2.05	1.40	0.85	0.39
		p_mh+	0.00	0.02	0.08	0.19	0.35
Romania	Reduced visit to doctors	Q_mh+	0.68	0.38	1.40	2.26	3.01
		p_mh+	0.25	0.35	0.08	0.01	0.00
	Reduced spending on medical care or medicine	Q_mh+	0.99	0.03	1.02	1.86	2.59
		p_mh+	0.16	0.49	0.15	0.03	0.00
	Adopted at least one harmful strategy	Q_mh+	1.50	0.18	0.74	1.66	2.46
		p_mh+	0.07	0.43	0.23	0.05	0.01
Turkey	Reduced visit t doctor	Q_mh+	2.64	1.46	0.49	0.12	0.83
		p_mh+	0.00	0.07	0.31	0.45	0.20
	Reduced spending on medical care or medicine	Q_mh+	2.75	1.53	0.53	0.12	0.85
		p_mh+	0.00	0.06	0.3	0.45	0.20
	Adopted at least one harmful strategy	Q_mh+	2.94	1.57	0.45	0.33	1.15
		p_mh+	0.00	0.06	0.33	0.37	0.13

Note: ***p_mh+*** represents level of significance obtained from *Mantel-Haenszel* bounds test. "Γ" represents odds of differential assignment due to unobserved factors.

Table 9: Mantel-Haenszel bounds for education investments

Country	Coping Strategies	MH- Test statistics	Gamma (Γ) 1	1.25	1.5	1.75	2
Armenia	Withdrawn children from school	Q_mh+	0.21	-0.12	-0.32	-0.12	0.06
		p_mh+	0.42	0.55	0.63	0.55	0.48
	Postponed training	Q_mh+	1.34	0.88	0.52	0.21	-0.06
		p_mh+	0.09	0.19	0.30	0.42	0.52
	Chosen at least one harmful strategy	Q_mh+	1.00	0.46	0.02	-0.09	0.22
		p_mh+	0.16	0.32	0.49	0.54	0.41
Bulgaria	Reduced education cost	Q_mh+	9.63	8.57	7.76	7.10	6.56
		p_mh+	0.00	0.00	0.00	0.00	0.00
	Withdrawal of students	Q_mh+	0.66	0.42	0.23	0.08	-0.06
		p_mh+	0.26	0.34	0.41	0.47	0.52
	Postponing training	Q_mh+	-0.19	-0.38	-0.55	-0.56	-0.46
		p_mh+	0.57	0.65	0.71	0.71	0.68
	Adopted at least one harmful strategy	Q_mh+	9.81	8.73	7.89	7.22	6.66
		p_mh+	0.00	0.00	0.00	0.00	0.00
Montenegro	Withdrawal of students	Q_mh+	0.39	0.08	-0.17	-0.35	-0.18
		p_mh+	0.35	0.47	0.57	0.64	0.57
	Moved children to cheaper school	Q_mh+	-0.33	-0.08	0.17	0.39	0.58
		p_mh+	0.63	0.53	0.43	0.35	0.28
	Postponed training	Q_mh+	3.18	2.63	2.19	1.83	1.52
		p_mh+	0.00	0.00	0.01	0.03	0.06
	Adopted at least one harmful strategy	Q_mh+	2.73	2.12	1.62	1.22	0.87
		p_mh+	0.00	0.02	0.05	0.11	0.19
Romania	Withdrawn children from extra-curricular activities	Q_mh+	2.75	1.73	0.90	0.21	0.17
		p_mh+	0.00	0.04	0.18	0.42	0.43
	Adopted at least one harmful strategy in education	Q_mh+	2.75	1.73	0.90	0.21	0.17
		p_mh+	0.00	0.04	0.18	0.42	0.43
Turkey	Withdrawn children from school	Q_mh+	0.11	0.04	0.50	0.89	1.23
		p_mh+	0.46	0.48	0.31	0.19	0.11
	Moved children to less expensive school	Q_mh+	2.13	1.74	1.45	1.20	1.00
		p_mh+	0.02	0.04	0.07	0.11	0.16
	Postponed training	Q_mh+	1.51	1.02	0.62	0.29	0.01
		p_mh+	0.07	0.15	0.27	0.39	0.50
	Adopted at least one harmful strategy	Q_mh+	2.15	1.38	0.76	0.24	-0.08
		p_mh+	0.02	0.08	0.22	0.41	0.53

Note: ***p_mh+*** represents level of significance obtained from *Mantel-Haenszel* bounds test. "Γ" represents odds of differential assignment due to unobserved factors.